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[57]申請專利範圍：

1. 一種虛擬商店，在一用來處理商務的分散式通信系統，該系統中包括：容許一顧客提出購物請求之一顧客系統，以及耦合到顧客系統之一伺服器系統；其中伺服器系統包括：一虛擬出納員，用來接收產品請求和支付資訊，且其中虛擬出納員對一第一網路住址作回應；其中伺服器系統包括虛擬商店，且其中虛擬商店對一第二網路位址作回應，該虛擬商店包括：

用來接收來自顧客系統之一購物請求的接收裝置；以及

用來將一產品請求發送到虛擬出納員的發送裝置。

2. 如申請專利範圍第1項之虛擬商店，其中：

接收裝置包括使用一種包含附屬在特定產品上之通用資源指標（"URLs"）的超本文置標語言（"HTML"）網頁，以便容許顧客系統選擇一項已知產品並藉

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以發出對應的URL給虛擬商店的裝置；以及

發送裝置包括用來發送描述至少一項產品之產品資訊以及識別至少一項產品的售賣者之商人識別符的裝置。

3. 一種虛擬出納員，在一用來處理商務的分散式通信系統中，該系統包括：容許一顧客提出購物請求之一顧客系統，以及耦合到顧客系統之一伺服器系統；其中伺服器系統包括：一虛擬商店，以供購物之用，且其中虛擬商店對一第一網路位址作回應；該虛擬出納員用來接收產品請求和支付資訊，其中伺服器系統包括虛擬出納員，且其中虛擬出納員對一第二網路位址作回應，該虛擬出納員包括：

用來接收來自虛擬商店之產品請求的第一接收裝置；以及

用來接收來自顧客系統之支付資訊的第二接收裝置。

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4.如申請專利範圍第3項之虛擬出納員，
其中第一接收裝置包括：一種用來接收
包含關於單一產品的資訊之一URL的
裝置。

5.如申請專利範圍第3項之虛擬出納員，
其中第一接收裝置包括：一用來接收顧
客已經選擇產品之一列表的裝置。

6.如申請專利範圍第3項之虛擬出納員，
其中第二接收裝置包括：一使虛擬出納
員與顧客之間的傳輸鏈接變安全的裝
置。

7.一種用來處理商務的方法，在一用來處
理商務的分散式通信系統中，其中通信
系統包括：容許一顧客提出購物請求之
一顧客系統，以及耦合到顧客系統之一
伺服器系統；其中伺服器系統包括：一
虛擬出納員，用來接收產品請求和支付
資訊，虛擬出納員對一第一網路位址作
回應；以及一虛擬商店，以供購物之
用，虛擬商店對一第二網路位址作回
應：該方法包括以下步驟：
在虛擬商店處接收來自顧客系統之一購
物請求；以及
將來自虛擬商店之一產品請求發送到虛
擬出納員。

8.一種用來處理商務的方法，在一用來處
理商務的分散式通信系統中，其中通信
系統包括：容許一顧客提出購物請求之
一顧客系統，以及耦合到顧客系統之一
伺服器系統：其中伺服器系統包括：一
虛擬出納員，用來接收產品請求和支付
資訊，虛擬出納員對一第一網路位址作
回應；以及一虛擬商店，以供購物之
用，虛擬商店對一第二網路位址作回
應：該方法包括以下步驟：
在虛擬出納員處接收來自虛擬商店的產
品請求；以及
在虛擬出納員處接收來自顧客系統的支
付資訊。

9.如申請專利範圍第8項之方法，還包括

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以下步驟：
將交易通知書發送給虛擬商店的擁有
者；以及
將交易確認訊息發送給顧客。

5. 10.一種電腦可讀媒體，在一用來處理商
務的分散式通信系統中，其中通信系統
包括：容許一顧客提出購物請求之一顧
客系統，以及耦合到顧客系統之一伺服
10. 器系統：其中伺服器系統包括：一虛擬
出納員用來接收產品請求和支付資訊，
虛擬出納員對一第一網路位址作回應；
以及一虛擬商店，以供購物之用，虛擬
商店對一第二網路位址回應；該電腦可
讀媒體包含用來處理商務的程式指令，
15. 該程式指令包括一些指令，用以：
在虛擬商店處接收來自顧客系統之一購
物請求；以及
將來自虛擬商店之一產品請求發送到虛
擬出納員。

20. 11.一種電腦可讀媒體，在一用來處理商
務的分散式通信系統中，其中通信系統
包括：容許一顧客提出購物請求之一顧
客系統，以及耦合到顧客系統之一伺服
器系統：其中伺服器系統包括：一虛擬
25. 出納員，用來接收產品請求和支付資
訊，虛擬出納員對一第一網路位址作回
應；以及一虛擬商店，以供購物之用，
虛擬商店對一第二網路位址作回應：該
電腦可讀媒體包含用來處理商務的程式
30. 指令，該程式指令包括一些指令，用
以：
在虛擬出納員處接收來自虛擬商店的產
品請求；以及
在虛擬出納員處接收來自顧客系統的支
35. 付資訊。

12.如申請專利範圍第11項之媒體，還包
括一些指令，以便：
將交易通知書發送給虛擬商店的擁有
者；以及
40. 將交易確認訊息發送給顧客。

5

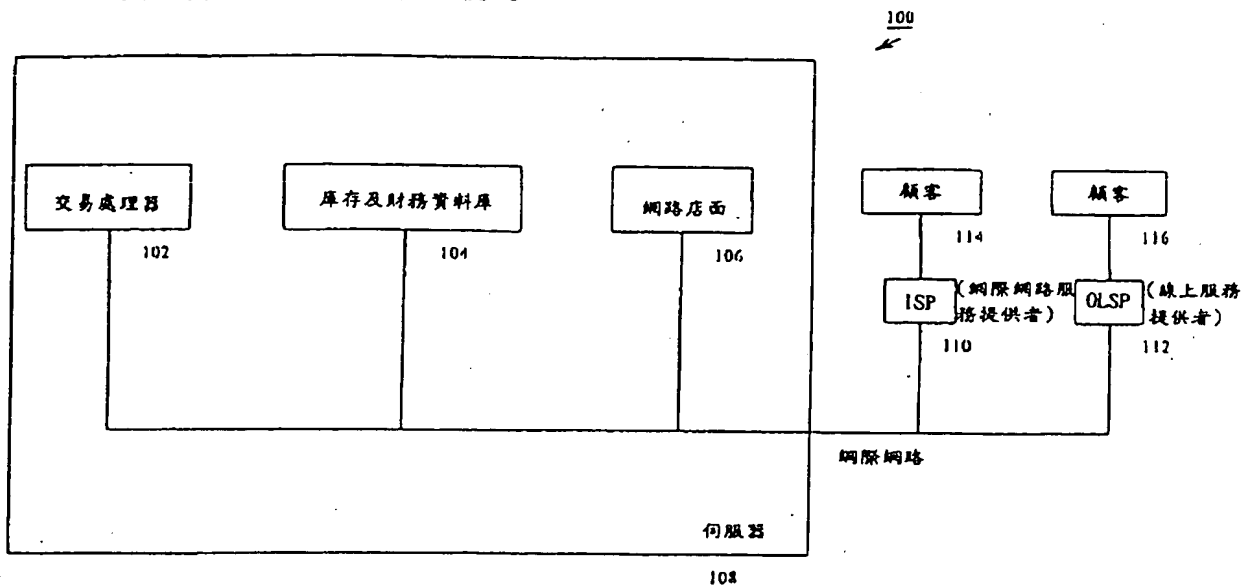圖式簡單說明：

第一圖是：根據先前技藝，針對全球資訊網(〝WWW〞)之一非分散式電子商務系統的一種功能性方塊圖。

第二圖是：根據本發明，針對WWW之一分散式電子商務系統的一種功能性方塊圖。

第三圖是：根據本發明，針對WWW之另一分散式電子商務系統的一

6
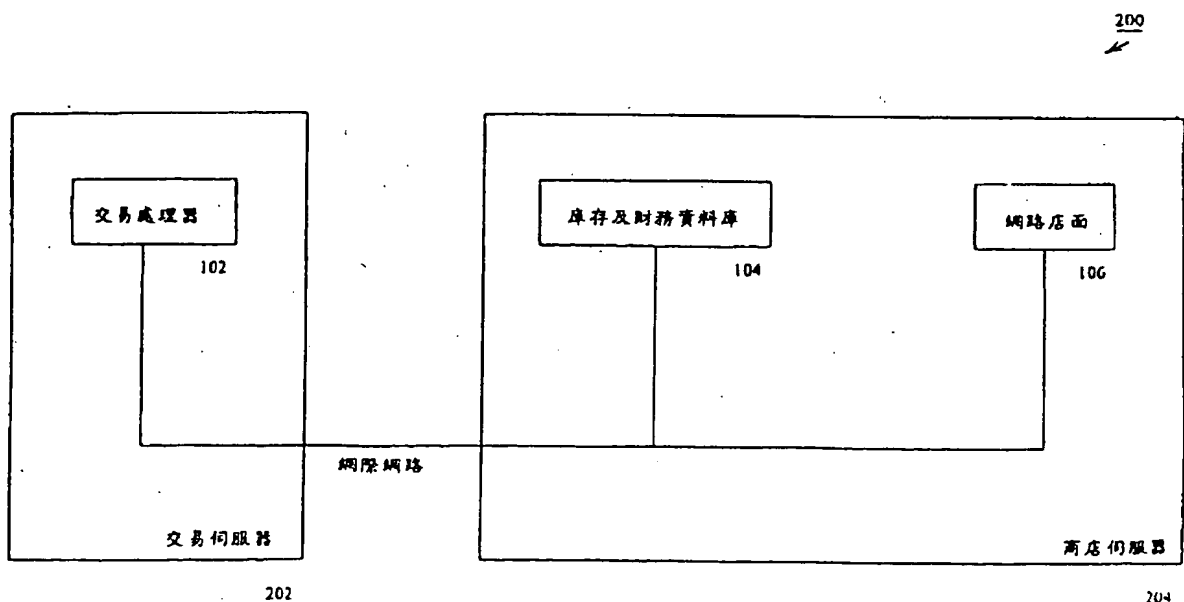
種功能性方塊圖。

第四圖是：根據本發明，針對WWW之另一分散式電子商務系統的一種功能性方塊圖。

第五圖是：諸多功能的一種流程圖，該功能是使用繪示於第四圖中的分散式電子商務系統而在一種由WWW顧客所提供的典型購物經驗中加以執行的。

100

交易處理器 102　庫存及財務資料庫 104　網路店面 106　顧客 114　顧客 116

ISP（網際網路服務提供者）110　OLSP（線上服務提供者）112

網際網路

伺服器 108

第一圖

200

交易處理器 102　庫存及財務資料庫 104　網路店面 106

網際網路

交易伺服器 202　商店伺服器 204

第二圖

第三圖

第四圖

開始

在商店伺服器
處購物　502

是否購買產品? ── 不是 ──→　504

↓ 是

經由URL(共通資源指標)
超鏈接到商店建立者伺
服器　506

創造購買網頁　508

是否增加產品
到購物籃中?　510 ── 不是 ──→

↓ 是

是否購買購物籃?　512 ── 不是 ──→

↓ 是

超鏈接到交易伺服器　514

建立到顧客的安全鏈接　516

得到顧客資訊　518

視情況:驗證信用卡,授
權支付金額轉帳資金　520

通知商人銷售並將確認
訊息發送到顧客　522

↙ 500
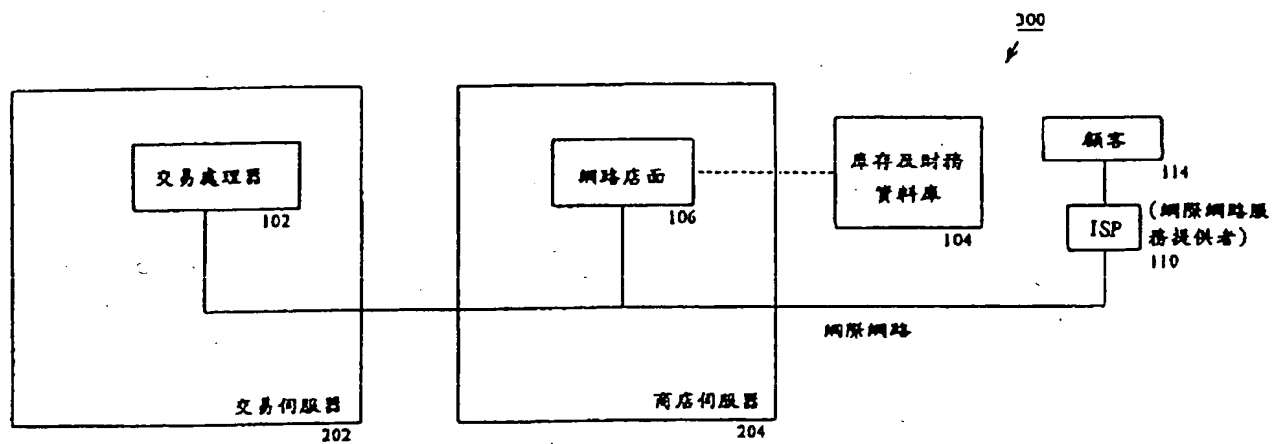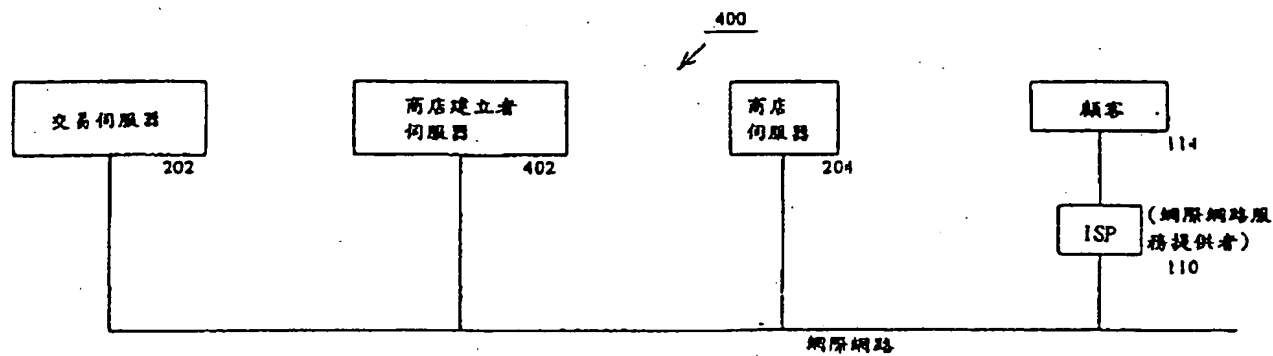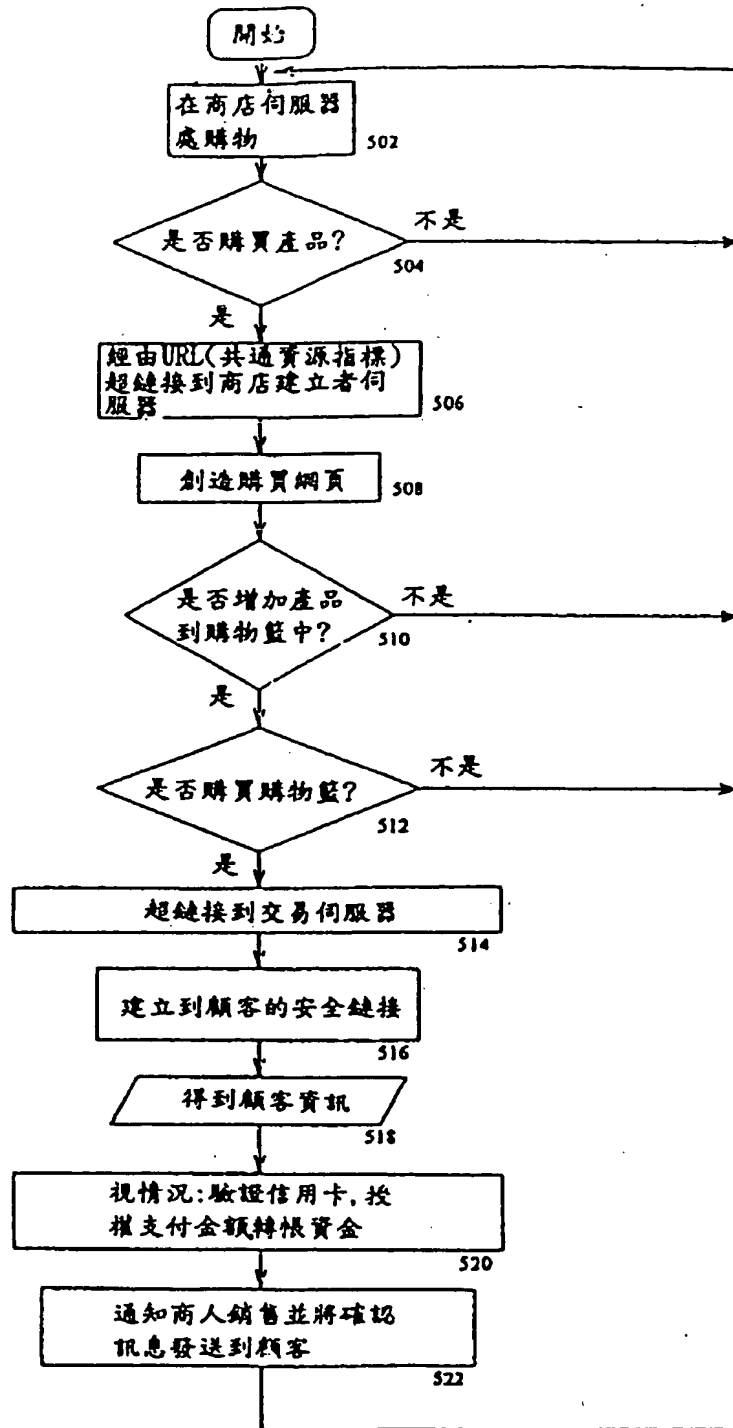
購物流程圖

第五圖

ABSTRACT

METHOD AND APPARATUS FOR CREATING A DISTRIBUTED ELECTRONIC COMMERCE SYSTEM

A method and system for transacting commerce in a distributed
communications system over the Internet comprises the reception and
transmission of shopping requests, product requests, and payment
information between distributed Web sites. The distributed communications
system comprises: a server system; and a customer system which is coupled
to the server system. The server system comprises a virtual cashier for
receiving product requests and payment information. The virtual cashier
responds to a first network address. The server system also comprises a
virtual store for shopping. The virtual store responds to a second network
address. The customer system allows a customer to make shopping
requests. Java applets and servlets running at distinct network addresses
provide much of the functionality. The system allows greater efficiencies and
lower costs for World Wide Web ("WWW") merchants and for Web site hosting
services.

79717.5

BC9-98-031   26

INVENTOR: Victor S. MOORE
              Glen R. WALTERS

METHOD AND APPARATUS FOR CREATING A DISTRIBUTED ELECTRONIC COMMERCE SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

Not applicable.

5

BACKGROUND OF THE INVENTION

1.   Field of the Invention.

The present invention relates generally to computer networks and more particularly to methods and apparatus for providing a scalable distributed

10   Internet commerce system.

2.   Description of the Related Art.

Another U.S. Pat. Application dealing with related technology has been ·filed on even date herewith. That application is entitled "A Method and

15   Apparatus for Creating a Merchant Web Site for Use in a Distributed

Electronic Commerce System" by Victor S. Moore and Glen R. Walters and is

assigned to International Business Machines ("IBM") with an IBM reference number of BC9-98-020 (referred to hereinafter as the "Development Tool Application").

The World-Wide-Web ("Web") has become immensely popular largely
5   because of the ease of finding information and the user-friendliness of today's browsers. A feature known as hypertext allows a user to access information from one Web page to another by simply pointing (using a pointing device such as a mouse) at the hypertext and clicking. Another feature that makes the Web attractive is having the ability to process the information (or content)
10   in remote Web pages without the requirement of having a specialized application program for each kind of content accessed. Thus, the same content is viewed across different platforms. Browser technology has evolved to enable the running of applications that manipulate this content across platforms.

15   The Web relies on an application protocol called HTML (Hyper-Text Mark Up Language), which is an interpretative scripting language, for rendering text, graphics, images, audio, real-time video, and other types of content on a Web compliant browser. HTML is independent of client operating systems. Therefore, HTML renders the same content across a wide
20   variety of software and hardware operating platforms. The software platforms include without limitation Windows 3.1, Windows NT, Apple's Copeland and Macintosh, and IBM's AIX and OS/2, and HP Unix. Popular compliant Web-Browsers include without limitation Microsoft's Internet Explorer, Netscape Navigator, Lynx, and Mosaic. HTML interprets links to files, images, sound
25   clips, and other types of content through the use of hypertext links. Upon user invocation of a hypertext link to a Web page, the browser initiates a network request to receive the desired Web page.

The use of electronic commerce on the Web is growing. A variety of traditional larger retailers and larger mail order catalog companies have been offering their goods for sale electronically over the Web. Everything from the actual shopping to the determination of available inventory and the

5   acceptance of payment is accomplished electronically. The merchant's Web site or Web storefront handles all shopping, selection, and acceptance of payment transactions automatically. Unlike traditional storefronts, these automatic capabilities enable a merchant to have its goods offered for sale twenty four hours a day, every day of the year (for an example of a traditional

10   catalog company with its goods available via the Web refer to L.L. BEAN of Freeport, Maine, whose URL is www.llbean.com). But the ability to host retail merchandise on the Web is not without difficulties.

It is difficult to integrate the major functions of electronic Web commerce. Three functions, in particular, are typically integrated in a retail

15   Web site. The first function is the virtual presentation, using text, graphics, or otherwise, of a merchant's products to customers. This is sometimes called the "electronic storefront" or "Web storefront," or in the case of a catalog merchant, the "electronic catalog." The second function is the maintenance of inventory, stock, pricing, and availability of each product, as well as tracking

20   sales and revenues. The third function is performing the electronic transactions for payment in a secure environment, where the collection of a customer's payment information, such as a credit card, is performed. Typically, most electronic commerce sites integrate all three of these functions at one physical site.

25   Companies desiring to do business over the Web face many problems. A first problem is the expense and complexity of setting up the necessary elements of an electronic commerce server. This difficulty includes: (1) hosting of the Web storefront; (2) maintenance of an inventory and financial

database; and (3) the roll out of a secured Transaction Server. The initial up-front cost is a significant barrier for most small businesses desiring to gain a presence on the Web. Therefore, a need exists to lower or even to eliminate the high-cost barrier typically associated with setting up electronic commerce

5   on the Web. The cost not only involves software design and implementation, and setting up the necessary equipment, but the initial hardware investment capable of running all three elements of an electronic commerce server for one business.

A second problem is meeting the requirement that the Web storefront

10   or Web catalog be constantly up-to-date. Many businesses pay dedicated personnel to update, create, and modify their Web sites. The cost of the service to maintain a merchant's Web site can be significant. A need exists to provide a merchant with the capability of easily creating, modifying, and updating its own Web storefront.

15   A third problem is meeting the requirement that the Web storefront inventory and financial database must be maintained and updated. Sales, advertised specials, and other changes in pricing need to be reflected in the inventory database. For many smaller businesses the requirement to keep inventory and financial records electronically, not to mention the requirement

20   to be electronically connected to their Web storefront, is too complex and too costly. Many smaller businesses use simple written ledgers or standalone software applications to control their inventories and finances. For merchants desiring to sell goods and services over the Internet, a need exists to be able to have their inventory and finances maintained in a scalable fashion. In this

25   way, as the business grows, the merchant can migrate from a pencil and ledger, through a stand-alone electronic database, up to a fully connected and automated database.

A fourth problem is meeting the requirement to automatically accept secure, electronic forms of payments. The need to have encryption and clearance software, secure server hardware, and secure firewalls makes this requirement expensive. For merchants desiring to set up Web storefronts, a

5   need exists to be able to scale electronic payments to meet their needs.

A fifth problem is achieving the ability to advertise to news groups and other Internet text-based users, as opposed to graphics-based users. Popular text-only viewers such as Lynx do not have graphical HTML capabilities. A need thus exists for merchants to be able to advertise anywhere and to

10   process payment information even in text-only based electronic commerce.

As mentioned earlier, one of the concerns for a merchant desiring to do electronic commerce is the Web site development. In the case of a large company that wants to have all three functions integrated into one Web site, these costs can easily exceed $1 million. In addition, even though the

15   programming will usually not be done by the merchant, the merchant will have to devote substantial amounts of time to the layout design and to the review. These costs, in time and money, are significant. Smaller companies may opt to create their own Web sites. This undertaking can be quite difficult, however, for the merchant who is not a sophisticated computer user. While it

20   is relatively easy to create a Web site, without competent guidance the site may be poorly designed and therefore of little economic value. There is, therefore, a need for a development tool which simplifies the design, creation, and maintenance of a Web site for merchants.

25   SUMMARY OF THE INVENTION

Briefly, in accordance with one aspect of the invention, a method for transacting business in a distributed communications system comprises: receiving a shopping request at a virtual store from a customer system; and

sending a product request to a virtual cashier from the virtual store. The distributed communications system comprises: a server system; and a customer system which is coupled to the server system. The server system comprises the virtual cashier for receiving product requests and payment information. The virtual cashier responds to a first network address. The server system also comprises the virtual store for shopping. The virtual store responds to a second network address. The customer system allows a customer to make shopping requests.

Briefly, in accordance with another aspect of the invention, a method for transacting business in the distributed communications system comprises: receiving product requests at the virtual cashier from the virtual store; and receiving payment information at the virtual cashier from the customer system.

Briefly, in accordance with other aspects of the invention, computer readable media contain program instructions for implementing the above methods.

Briefly, in accordance with other aspects of the invention, virtual stores and virtual cashiers implement the above methods.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a functional block diagram of a non-distributed electronic commerce system for the World Wide Web ("WWW"), according to the prior art.

FIG. 2 is a functional block diagram of a distributed electronic commerce system for the WWW, according to the present invention.

FIG. 3 is a functional block diagram of another distributed electronic commerce system for the WWW, according to the present invention.

FIG. 4 is a functional block diagram of another distributed electronic commerce system for the WWW, according to the present invention.

FIG. 5 is a flow diagram of the functions that are performed in a typical shopping experience by a WWW customer using the distributed electronic commerce system depicted in FIG. 4.

DETAILED DESCRIPTION OF AN EMBODIMENT

1.   Introduction and Overview

Referring to FIG. 1, there is shown a system 100, according to the prior art, in which the three functions of product presentation, database management, and transaction processing are contained in one server 108 and are, therefore, not distributed. The server 108 refers to a specific computer. These three functions are performed by the Web storefront 106, the inventory and financial database 104, and the Transaction Server 102, respectively. An example of a provider of this type of non-distributed service is Net.Commerce. It is quite possible, however, to distribute the three functions amongst two or more separate servers.

FIG. 1 also illustrates a functional diagram of a computer network for World Wide Web ("WWW") access from customers 114, 116 to the server 108. Access to the server 108 can be accomplished directly through a local Internet Service Provider ("ISP") 110, or through an on-line service provider ("OLSP") 112 such as CompuServe, Prodigy, or America Online.

One method of distributing the electronic commerce functions is to separate out the function of the Transaction Server from the Web storefront and the inventory and financial database. Referring to FIG. 2, there is shown a system 200 containing a Transaction Processor 102 on one server (the Transaction Server 202), and a Web storefront 106 and inventory and financial database 104 both on a second server (the Store Server 204). This may be desirable, for instance, when the Web merchant desires to maintain its own Web storefront, whether due to the merchant's expertise, physical

distance from the transaction service provider, or otherwise. Such a merchant could use any of the many hosting service providers such as CyberGate, Magg.Net, and UUNet.

FIG. 3 shows a system 300 with a further distribution, in which the
5   database 104 is not on-line. The dashed line in FIG. 3 indicates that the inventory and financial system may or may not be electrically connected to the server. A computerized system could have an electrical interface to the server and not be located on the server itself. Alternatively, the inventory and financial system may be stand alone. This may be the case if the Web
10   merchant does not have a computerized inventory and financial database system, or if the merchant has a computerized database system but simply does not have it connected to the server.

Referring to FIG. 2, the Store Server 204 is a conventional HTTPd (Hyper-Text Transfer Protocol daemon). In the preferred embodiment, it is a
15   Sun Microsystems's Java compliant HTTPd server running Java compliant supporting standard servlet interfaces such as Netscape Java Server software or Lotus Domino Go Java software. By using a Java compliant implementation, the same code can run on a variety of operating systems supporting the Java Virtual Machine including without limitation Solaris, Unix,
20   AIX, OS/2, and Windows 95/NT operating systems.

As an overview, and referring to FIG. 3, the Transaction Server 202 now does not host the Web storefront 106. However, the Transaction Server 202 need not store any of the inventory or financial data nor any other information on the product line of the merchant. All the information that the
25   Transaction Server 202 needs in order to process a purchase (for example, from customer 114) is sent to it every time that a purchase is requested. The Transaction Server 202 verifies that the customer 114 wants to make a purchase of a specific "shopping basket" of products and prompts the

customer 114 for payment information. Either the merchant or the Transaction Server 202 can perform the tasks of credit card verification, authorization of the total purchase amount, and funds transfer. When the Transaction Server 202 has finished its tasks, it then provides the merchant

5 with a status report of the transaction and the customer with a confirmation.

The Web storefront 106 acts as the virtual store for the customer 114, and contains whatever information the merchant has built into the Web-site (e.g. pictures, prices, search engines, etc.). In the Development Tool Application, there is provided a Development Tool for designing the Web

10 storefront 106. This tool greatly simplifies the task of creating the Web storefront initially and of modifying it and updating it. The Tool also ensures that the operation with the Transaction Server 202 is seamless for the customer 114.

The Tool derives much of its utility from the fact that it contains a series

15 of templates, tailored to different industries, for creating pages. The fields on these templates can be filled with text, or with images from clip art (also included with the tool) or can be tailored to suit a specific merchant's needs. The task is greatly simplified by the inclusion of a prompting mode in which the tool will actually step a user through the process. As an additional

20 tailoring feature, the tool can be adapted to whatever "look and feel" the customer may desire. The customer may want to match the look and feel to that of other applications that the customer uses, or may simply feel more comfortable with another look and feel.

In the preferred embodiment, the Tool, as either an applet which would

25 run on top of a browser or as an application, would be downloaded from a Store Builder Server. Referring to FIG. 4, there is shown a distributed electronic commerce system 400 with a Store Builder Server 402. The merchant would download the Java wizard applet to build the pages for the

Web storefront, which will reside on the Store Server 204. The Store Builder Server 402 would also contain Java servlets that would receive the HTML from the wizard applet for the storefront pages that the merchant designed and would build the store pages from this HTML. This, of course, would

5   happen when the merchant initially designed the pages, or whenever the merchant updated or modified them. The servlet, on the Store Builder Server 402, would then publish the Web storefront pages wherever the merchant designates. The commerce system is thereby distributed even more, by separating (if desired) the tasks associated with designing the merchant's

10   Web site. In alternate embodiments, the Tool could be downloaded from the Transaction Server 206 or obtained on a CD ROM or other recordable medium.

2.   Detailed Description of the Shopping Flow

15   Referring to FIG. 5, flow diagram 500 illustrates the high-level functions that each of the servers (see FIG. 4), or each of the Web sites hosted thereon, performs in a typical shopping experience of a customer.

The customer, using a browser, goes to the Store Server and begins shopping, that is, browsing the content of the Web storefront 502. When the

20   customer finds a product that the customer would like to buy, he selects that product 504. The Store Server then jumps to the Store Builder Server by using a Uniform Resource Locator ("URL") 506. The URL, called a price URL, contains all of the relevant information on the product, and all the information necessary to build a "Buy Page." The relevant product information includes a

25   picture of the product, the product's price, and a description of the product.

The Store Builder Server receives the price URL, which is encrypted, and a Java "Buy Page" servlet builds a Buy Page from the received HTML 508. The customer can now either accept by selecting the option that puts the

product in the customer's "shopping basket," or cancel the buy 510. If the buy operation is canceled, then the customer is returned to the Store Server and can continue shopping. If the buy operation is accepted the Store Builder Server then presents the customer with his entire shopping basket up to that

5   point, which the Store Builder Server creates and maintains. The customer can now delete items from the basket, change the quantities, "purchase" the entire basket, or return to the Store Server to continue shopping 512. It should be clear that the previous buy operation was equivalent to dropping the product in the shopping basket, and the purchase operation is equivalent to

10   going to the check-out counter. The Java servlet that maintains the shopping basket could use any of a variety of means, including without limitation tracking the Web customer's browser address or prompting the customer for a name, for keeping track of which customer belongs to which basket.

The customer leaves his shopping basket page by either making a

15   purchase or continuing shopping. If the customer decides to make the purchase, he is hyperlinked to the Transaction Server 514. The Transaction Server, thus, is not involved until money is ready to be transferred. The Transaction Server, therefore, immediately establishes a secure link between itself and the customer's browser 516. Any security protocol could be used,

20   but the secure sockets layer ("SSL") protocol is preferred. After establishing a secure link, the Transaction Server prompts the customer for the necessary identification, delivery, and payment information 518.

In an alternate embodiment, the functions of establishing a secure link and getting the customer's payment information could be done in the Store

25   Builder Server. The Transaction Server would then receive this information from the Store Builder Server, in an encrypted form, and decrypt it. This would provide an embodiment in which the Transaction Server did not need to

interact in real-time with the customer, but merely provide a confirmation if desired.

The Transaction Server may, optionally, verify the credit card information, authorize the payment amount, and transfer the funds to the merchant's account 520. The Transaction Server would do this by using a third party credit card clearinghouse such as IC Verify or Automated Transaction Services (ATS). The merchant need not request this service from the Transaction Server, however. Low-volume merchants may prefer simply to be e-mailed (securely) or faxed the entire purchase order, and perform these functions themselves, thereby saving the associated cost that the transaction service provider would have charged. Additionally, the merchant may prefer to check his inventory before charging the customer.

In either case, the Transaction Server will notify the merchant of the status of the transaction and supply all of the product, customer, delivery, and payment information 522. If the customer provided an e-mail account, then the Transaction Server will also send a confirmation of the transaction to the customer 522.

The Transaction Server could also perform, in alternate embodiments, the functions of the Store Builder Server. In such an embodiment, the price URL would hyperlink to the Transaction Server which would contain the Java servlet that builds the Buy Page, and the Java servlet that maintains the shopping basket.

3.   High-Level Functions Performed by each Server

Having explained the sequence of events and communications between the servers during a typical transaction, it will be instructive to summarize, individually, the functions performed by each of the servers.

a.   Functions Performed by the Store Server

The Web storefront performs one basic service, and that is to present the multi-media content to the customer in order to let the customer shop. The format of this presentation is controlled by the merchant, and can easily

5   be designed using the Development Tool disclosed in the Development Tool Application mentioned earlier.

The Web storefront could have a variety of other functions associated with it. For instance, background information on the merchant, contact information, news items of interest to the merchant's customers, etc. can all

10   be displayed on the Web storefront.

As discussed earlier, the merchant can control inventory and financial data in any manner desired. If the merchant utilizes a computer-based database, then the merchant can also interface this to the Web storefront. This could be used to supply information on backorders, quantities available,

15   current prices, etc. to the customer. In a sophisticated system, the database could even possibly be interfaced electronically with the Transaction Server by creating a program that processes the e-mail order notifications sent by the Transaction Server.

20   b.   Functions Performed by the Store Builder Server

The first major function of the Store Builder Server is to help the merchant get his Web storefront up and running. The Store Builder Server first provides the wizard applet or application, which allows the merchant to create his Web storefront. The Store Builder Server then accepts the HTML

25   for the Web storefront from the merchant and builds the Web storefront. The Store Builder Server then publishes the Web storefront at a site of the merchant's choosing. The merchant supplies a user ID and a password to the Store Builder Server, and the Store Builder Server uses file transfer protocol

("FTP"), or some other service, to send the Web pages to the chosen hosting site.

The second major function of the Store Builder Server is to provide the shopping basket for the customer. The Store Builder Server places each
5   product in the basket as the customer selects or buys them and holds them until the customer is ready to check out. At that point, the Store Builder Server transfers control, and the relevant information, to the Transaction Server.

10   c.   Functions Performed by the Transaction Server

The Transaction Server has only one general responsibility, and that is to process the customer's information. This involves getting the information from the customer and transferring it to the merchant. As explained earlier, it may also involve verifying the information, getting the purchase authorized,
15   and transferring the funds. Additionally, the Transaction Server can also send the customer a confirmation of the transaction.

Also of importance is the fact that the Transaction Server, like the Store Builder Server, need not know where the Store Server is located. That is, the Transaction Server does not require that the Store Server, or even the Store
20   Builder Server, be at any particular Internet address. Even in an embodiment in which the Transaction Server also performed the functions of the Store Builder Server, the Transaction Server would not need to know where the Store Server was located. In such a case, the Transaction Server would receive the price URL with the product information. It is evident, however, that
25   once the price URL is sent, the location of the Store Server (or rather, the location from which the price URL was sent) is, and needs to be, known. Knowing where the price URL was sent from (typically a page from the Store

Server) allows the Transaction Server or the Store Builder Server to hyperlink the Web customer back there to continue shopping.

4.   Advantages associated with the Preferred Embodiment

    a.   Advantages for the Merchant

The preferred embodiment has a number of significant advantages for the merchant who desires to participate in electronic commerce. First, it is less expensive than the non-distributed system. The merchant need only buy the Development Tool to create the Web site, pay for hosting of the Web storefront at an ISP of the merchant's choice, and pay the charge for the transaction services (usually based on volume). Hosting fees can be as low as twenty dollars per month depending on the memory and the bandwidth required.

Second, it is much simpler to create the Web storefront than to create an ordinary electronic commerce Web site. The Development Tool, which is described in the Development Tool Application mentioned earlier, allows the merchant to design, build, and publish a web site in a short period of time. It also makes it easy to modify the site.. This is to be compared with the process of hiring a professional to do it, or with educating oneself about the process and doing it alone.

Third, it offers a great deal of control to the merchant. The merchant. can redesign the site, change prices, decide to have a sale, add or delete products, update the site with pictures or other content, expand the number of places that offer the products for sale on-line, change hosting sites, and much more, all without even notifying the Store Builder Server or the Transaction Server. The merchant has almost complete control. The merchant can do anything the merchant wants with the site or with the information on the site. The only restriction is that the price URLs, which allow the Store Builder

Server to build the Buy Pages, have to be included on the site, or elsewhere, in order for the Web customer to place an order. The merchant can even totally remove the Web storefront, and simply post the price URLs on news groups or on another web site.

5   It should be clear that the distributed electronic commerce system offers significant advantages to all merchants, particularly those of small to medium size.

b.   Advantages for the Transaction Service Provider

10   There are a number of distinct advantages that this embodiment offers the transaction service provider. First, overhead is minimized. Much of the overhead and cost of hosting a commerce Web site comes from the bandwidth requirement. Every time that a Web site gets a "hit," information must be transmitted. If the transaction service provider chooses not to host

15   the Web storefronts, then it does not have to process any of the hits associated with all of the shopping that occurs on the Web storefronts. The bandwidth usage will be even lower because, presumably, many of the merchants will choose to do their own credit card verification, thereby eliminating those transmissions as well. Further, in embodiments utilizing a

20   Store Builder Server, the Transaction Server does not need to maintain the shopping baskets, nor process the hits associated with each of the buys.

Second, the amount of memory required is minimized. The Transaction Server does not need to host any of the Web storefronts, nor does it need to maintain any shopping baskets nor any information on the products being

25   offered for sale by the merchants, nor does it need to keep any data regarding the Store Servers. In the preferred embodiment, the primary merchant-related data that the Transaction Server needs to store is a list of all of the registered merchants and their contact information. Clearly, however, Transaction

Servers will want to keep track of sales so that they can bill the merchant's for their services, and may want to store additional information and statistics about the merchants as well.

Third, the barrier to entering into electronic commerce is lowered for the merchants. This benefits the transaction service provider because it opens up a whole new group of potential customers. These potential customers are the merchants who could not afford to do non-distributed Web commerce.

Fourth, the technique is also scalable. The transaction service provider can serve a much larger number of merchants with a given Transaction Server (due to the advantages above). If the number of sales grows and a particular Transaction Server reaches its threshold in memory or bandwidth, then the transaction service provider can simply add another Transaction Server and have the Store Builder Server direct some of the traffic to it. The Store Builder Server is also scalable, and if an additional server is needed due to volume it can be added. In that case, the provider can use the new server for future merchants or even direct current merchants to create any future price URLs (for new products or changes for existing products) using the new server.

5.   Virtual Commerce

It is useful to broaden some of the concepts introduced or discussed above in order to see how they fit into the broader concept of virtual commerce. The merchant's web site, that is the actual web pages, can be considered to be a virtual store. The virtual store could span across one or more physical servers or computers, and these servers can collectively be referred to as the store server system. Analogously, the transaction service provider's web site can be considered to be a virtual cashier, spanning across a cashier server system comprised of one or more servers. The store builder

jserver web site could be considered to be yet a third virtual entity. or it can more simply be considered to be either part of the virtual store or the virtual cashier.

Numerous criteria could be developed to determine when these virtual entities could be considered to be distributed. Some such criteria include: different servers or computers hosting the web sites; different processors executing the instructions associated with each web site, with each processor potentially accessing the same memory; or each web site merely responding to a different network address, possibly residing in the same memory on a common server, running on the same processor, and accessing the network over the same hardware such as a communications card. Each of these ideas is meant to be encompassed in the present application when referring to distributed systems. For this reason, the computers or servers that are part of the store server system may also form part of the cashier server system.

These virtual stores and cashiers are presently displayed over the World Wide Web and the Internet, but future networks will surely arise for which virtual commerce will be applicable. Further, the present means of accessing and displaying virtual entities will change. Presently, web browsers running on personal computers processing HTML pages with HTTP requests and using URLs to link between pages is the preferred mechanism or system for customers to access the content. Software and computer technology will quickly replace many of these standards. Additionally, other technologies involving optics, magnetics, and other sciences could also produce viable methods of accessing and displaying virtual entities. Each of these potential advances, when used to enable a distributed commerce system over a network, can be viewed as a further embodiment of the present invention.

6.   General Implementation

Distributed commerce systems, in accordance with the present invention can be, at least partially, implemented by hardware, software, or a combination of both. This may be done for example, by Java applets and

5   servlets running on a variety of host equipment. Moreover, this functionality may be embodied in computer readable media such as 3.5 inch diskettes to be used in programming an information-processing apparatus to perform in accordance with the invention. This functionality may also be embodied in computer readable media such as a transmitted waveform to be used in

10   transmitting the information or functionality.

Although a specific embodiment of the invention has been disclosed, it will be understood by those having skill in the art that changes can be made to this specific embodiment without departing from the spirit and scope of the invention. The scope of the invention is not to be restricted, therefore, to the

15   specific embodiment, and it is intended that the appended claims cover any and all such applications, modifications, and embodiments within the scope of the present invention.

3. In a distributed communications system for transacting business comprising a customer system for allowing a customer to make shopping requests, and a server system which is coupled to the customer system, wherein the server system comprises a virtual store for shopping, and wherein the virtual store responds to a first network address; a virtual cashier for receiving product requests and payment information, wherein the server system comprises the virtual cashier, and wherein the virtual cashier responds to a second network address, the virtual cashier comprising:

first receiving means for receiving product requests from the virtual store;

second receiving means for receiving payment information from the customer system.

4. The virtual cashier of claim 3, wherein the first receiving means comprises a means for receiving a URL containing information about a single product.

5. The virtual cashier of claim 3, wherein the first receiving means comprises a means for receiving a list of products which a customer has selected.

6. The virtual cashier of claim 3, wherein the second receiving means comprises a means for securing the transmission link between the virtual cashier and the customer.

1	7.	In a distributed communications system for transacting business,
2		wherein the communications system comprises a customer system for
3		allowing a customer to make shopping requests, and a server system
4		which is coupled to the customer system; wherein the server system
5		comprises a virtual cashier for receiving product requests and payment
6		information, the virtual cashier responding to a first network address,
7		and a virtual store for shopping, the virtual store responding to a
8		second network address; a method for transacting business comprising
9		the steps of:
10		receiving a shopping request at the virtual store from the
11		customer system; and
12		sending a product request to the virtual cashier from the virtual
13		store.

1   8.   In a distributed communications system for transacting business,

2   wherein the communications system comprises a customer system for

3   allowing a customer to make shopping requests, and a server system

4   which is coupled to the customer system; wherein the server system

5   comprises a virtual cashier for receiving product requests and payment

6   information, the virtual cashier responding to a first network address,

7   and a virtual store for shopping, the virtual store responding to a

8   second network address; a method for transacting business comprising

9   the steps of:

10   receiving product requests at the virtual cashier from the virtual

11   store; and

12   receiving payment information at the virtual cashier from the

13   customer system.

1   9.   The method of claim 8, further comprising the steps of:

2   sending notification of the transaction to the owner of the virtual

3   store; and

4   sending confirmation of the transaction to the customer.

1   10.   In a distributed communications system for transacting business,

2   wherein the communications system comprises a customer system for

3   allowing a customer to make shopping requests, and a server system

4   which is coupled to the customer system; wherein the server system

5   comprises a virtual cashier for receiving product requests and payment

6   information, the virtual cashier responding to a first network address,

7   and a virtual store for shopping, the virtual store responding to a

8   second network address; a computer readable medium containing

9   program instructions for transacting business, the program instructions

10   comprising instructions for:

11   receiving a shopping request at the virtual store from the

12   customer system; and

13   sending a product request to the virtual cashier from the virtual
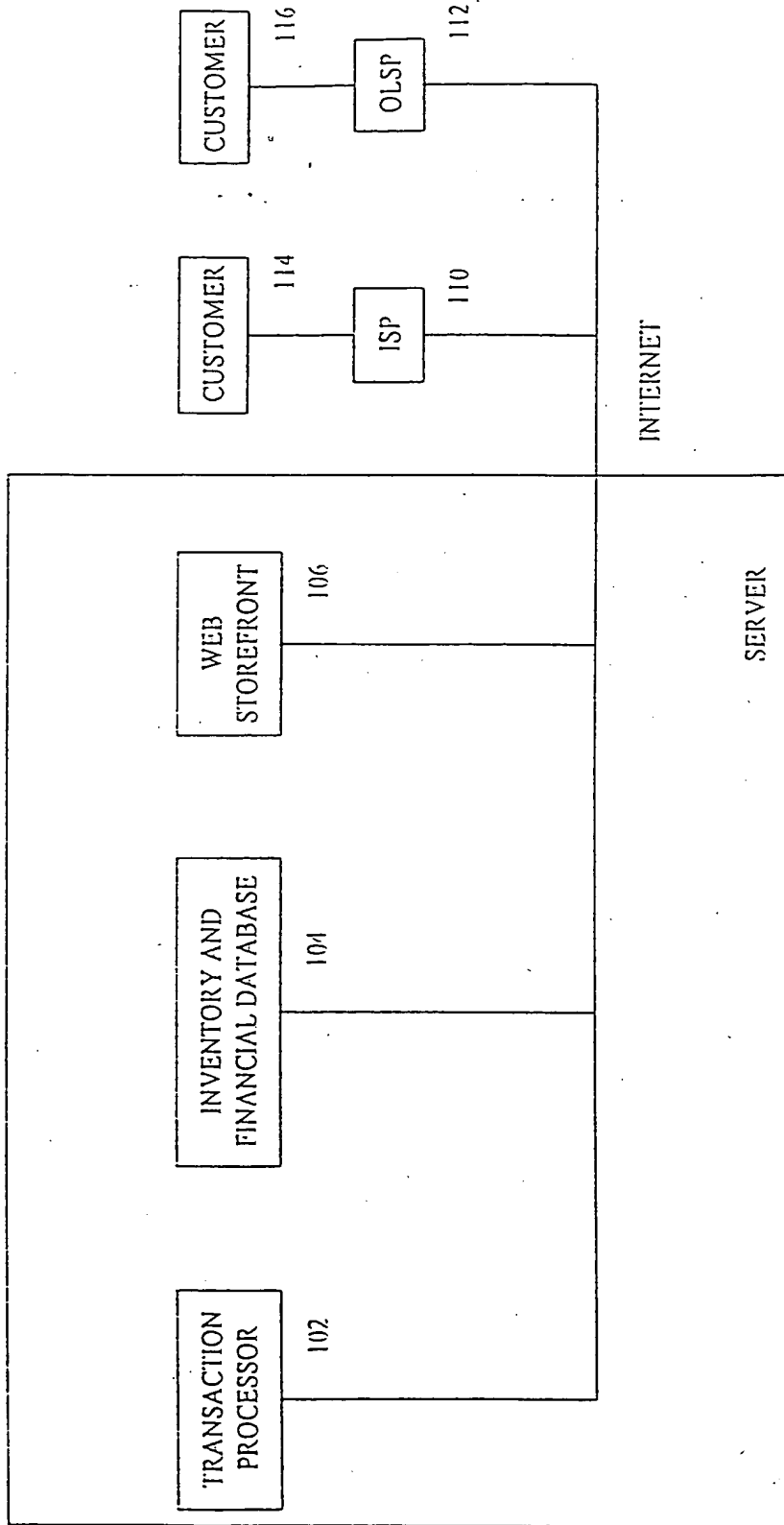
14   store.

)

)

1	11.	In a distributed communications system for transacting business.
2		wherein the communications system comprises a customer system for
3		allowing a customer to make shopping requests, and a server system
4		which is coupled to the customer system; wherein the server system
5		comprises a virtual cashier for receiving product requests and payment
6		information, the virtual cashier responding to a first network address,
7		and a virtual store for shopping, the virtual store responding to a
8		second network address; a computer readable medium containing
9		program instructions for transacting business, the program instructions
10		comprising instructions for:
11		receiving product requests at the virtual cashier from the virtual
12		store; and
13		receiving payment information at the virtual cashier from the
14		customer system.

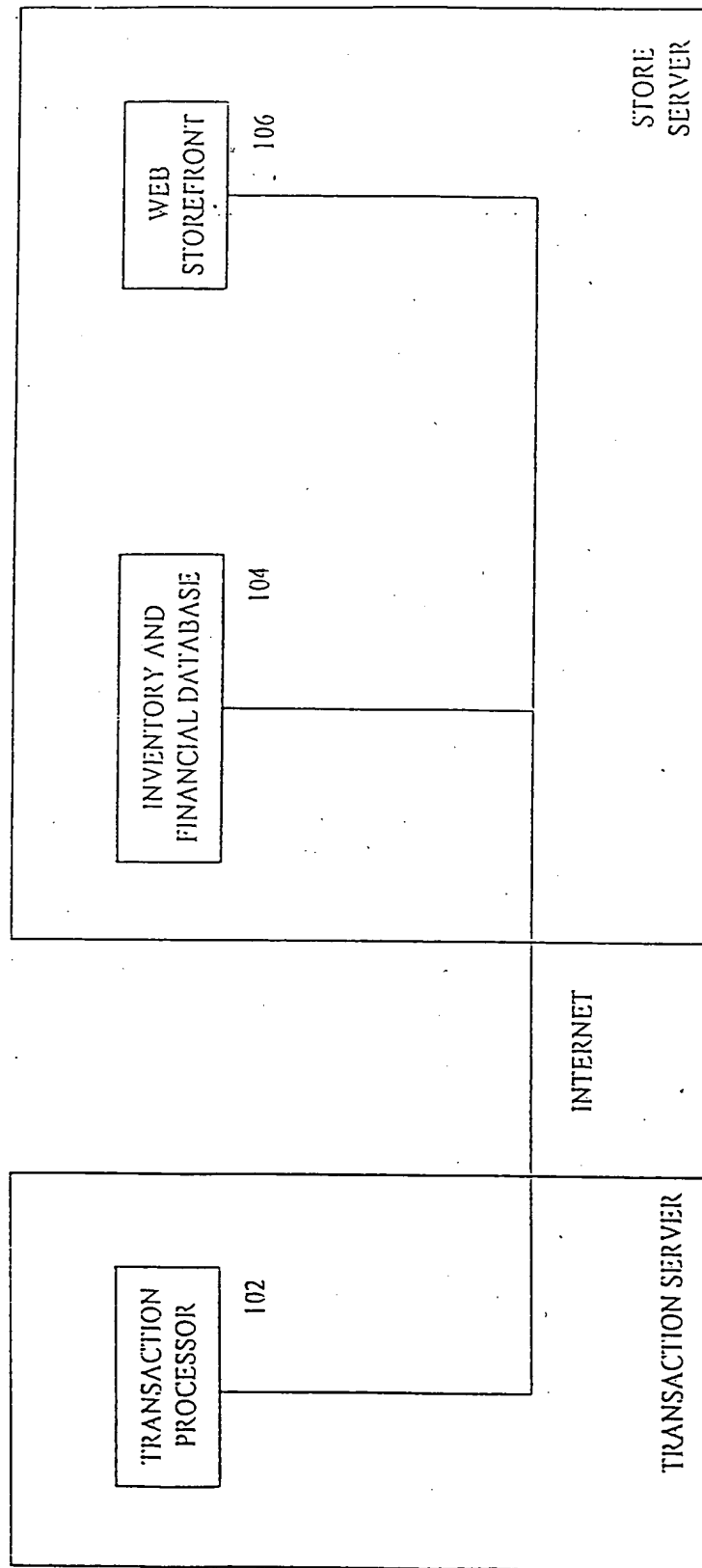|		
1	12.	The medium of claim 11, further comprising instructions for:
2		sending notification of the transaction to the owner of the virtual
3		store; and
4		sending confirmation of the transaction to the customer.

FIG. 1

PRIOR ART

100

CUSTOMER 116

OLSP 112

CUSTOMER 114

ISP 110

INTERNET

WEB STOREFRONT 106

INVENTORY AND FINANCIAL DATABASE 104

TRANSACTION PROCESSOR 102

SERVER 108

BC9-98-031

FIG. 2

200

WEB
STOREFRONT
106

INVENTORY AND
FINANCIAL DATABASE
104

STORE
SERVER

204

PRI2.FLO

INTERNET

TRANSACTION
PROCESSOR
102

TRANSACTION SERVER

202

FIG. 3

300

CUSTOMER 114

ISP 110

INVENTORY AND FINANCIAL DATABASE 104

INTERNET

WEB STOREFRONT 106

STORE SERVER 204

TRANSACTION PROCESSOR 102

TRANSACTION SERVER 202

FIG. 4

400

TRANSACTION SERVER
202

STORE BUILDER SERVER
402

STORE SERVER
204

CUSTOMER
114

ISP
110

INTERNET

PR14.FLO

START

SHOP AT
STORE SERVER 502

BUY A PRODUCT 504
Y
N

HYPERLINK TO STORE
BUILDER SERVER VIA URL 506

CREATE BUY PAGE 508

ADD PRODUCT
TO BASKET 510
Y
N

PURCHASE BASKET 512
Y
N

HYPERLINK TO TRANSACTION SERVER 514

ESTABLISH SECURE LINK
TO CUSTOMER 516

GET CUSTOMER INFO. 518

OPTIONAL: VERIFY CREDIT CARD,
AUTHORIZE AMOUNT, TRANSFER FUNDS 520
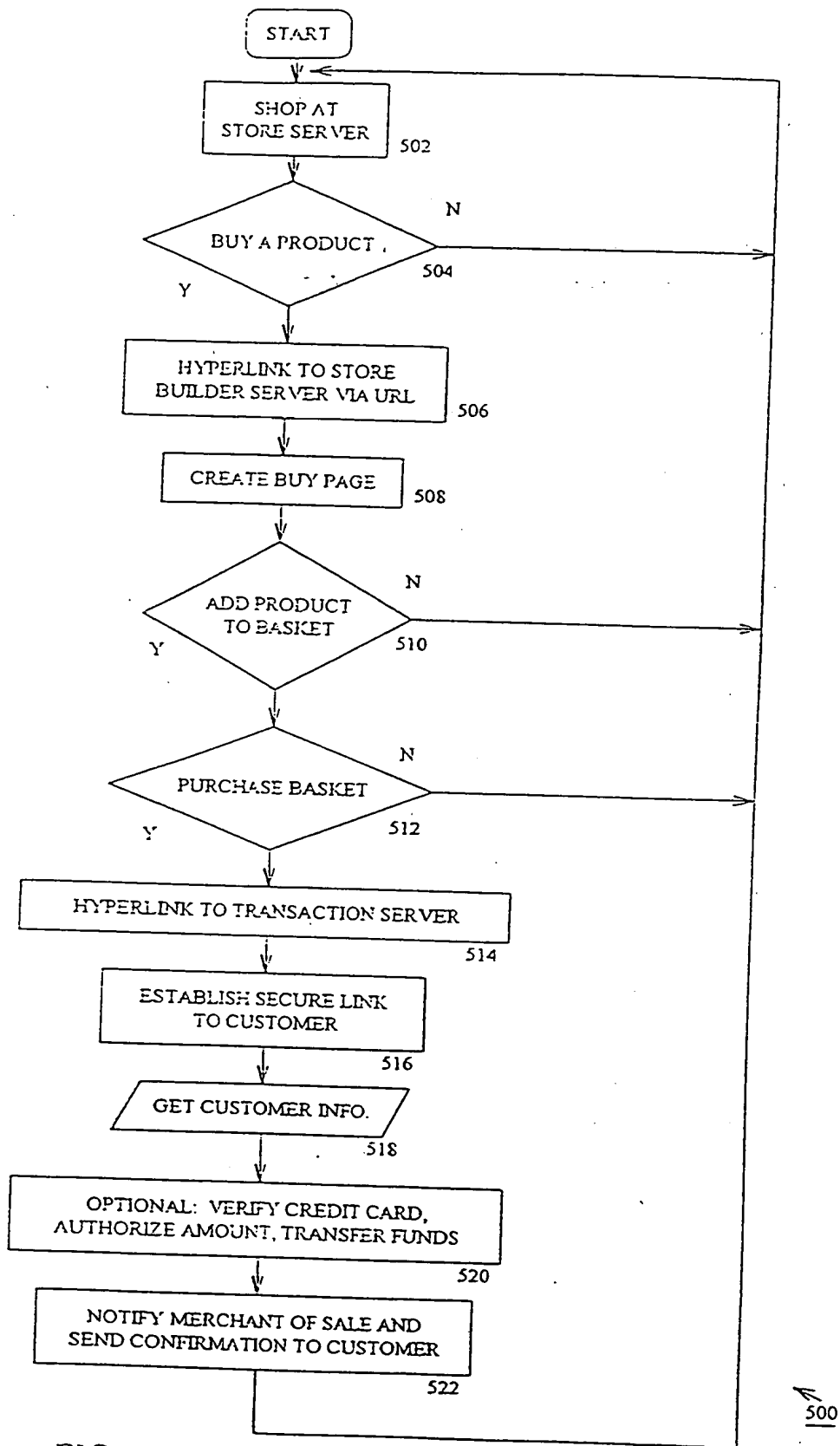
NOTIFY MERCHANT OF SALE AND
SEND CONFIRMATION TO CUSTOMER 522

500

FIG. 5   SHOPPING FLOW DIAGRAM

PRI5.FLO

BC9-98-031